



PASCO Actuators & Valves

NSF Series Scotch Yoke Type Pneumatic & Hydraulic Actuator



Pneumatic Actuator
Single Acting Type

Pneumatic Actuator
Double Acting Type



Hydraulic Actuator
Single Acting Type



Advantages

Water Ingress Protected

O-Rings are fitted on bodies, caps and so on, this ensure water ingress protected.

ISO Valve Mounting

The NSF Series actuators interface meets ISO standard, and meets the dimensional requirements of ISO defined for each torque range.

Standardization

The shaft driven accessory interface conforms to NAMUR and is identical on all NSF Series models, allowing standardization of accessory mounting hardware and installation practices.

Wear Resistant

The guide rod and piston rod have an advanced surface treatment, which combined with self-lubricating bearings, provides superior wear resistance and extends the life of all sliding components.

High Efficiency

The piston rod and guide block connection superior surface finishes and self-lubricating bearings maximize input energy transfer directly to the valve stem, efficiency is further enhanced by the tension-loaded spring, minimizing radial loads on the piston rod.



Corrosion Resistant

The NSF series actuators incorporate over three stages of internal and external coatings to resist severe weather, chemical and petroleum environments. The inner surface of cylinder is coated by PTFE, enhanced corrosion resistant and self-lubricating

Modular Design

NSF series actuators have available, field-serviceable drive, power, spring and override modules, the modules are removable, serviceable and interchangeable when mounted to the valve. Modules are available for separated purchase to reduce spare parts inventory

Safe Spring Module

To ensure the safety of personnel during installation and maintenance, the spring module has been designed so that it can only be removed from the power module with the spring in the fully extended position. This prevents accidental release of the spring force, protecting personnel from injury and the actuator from accidental damage.



General Application

Torque Outputs(guaranteed)

Double acting: 302~226,400Nm
Spring return end torques: 187~71753Nm

Operating Pressures

Pneumatic: 3~7 Bar
Hydraulic: 100 Bar (Over 100bar hydraulic pressure is available upon request)

Operating Temperatures:

Standard: -20°C~80°C
Low Temperature: -40°C~80°C
High Temperature: -20°C~150°C

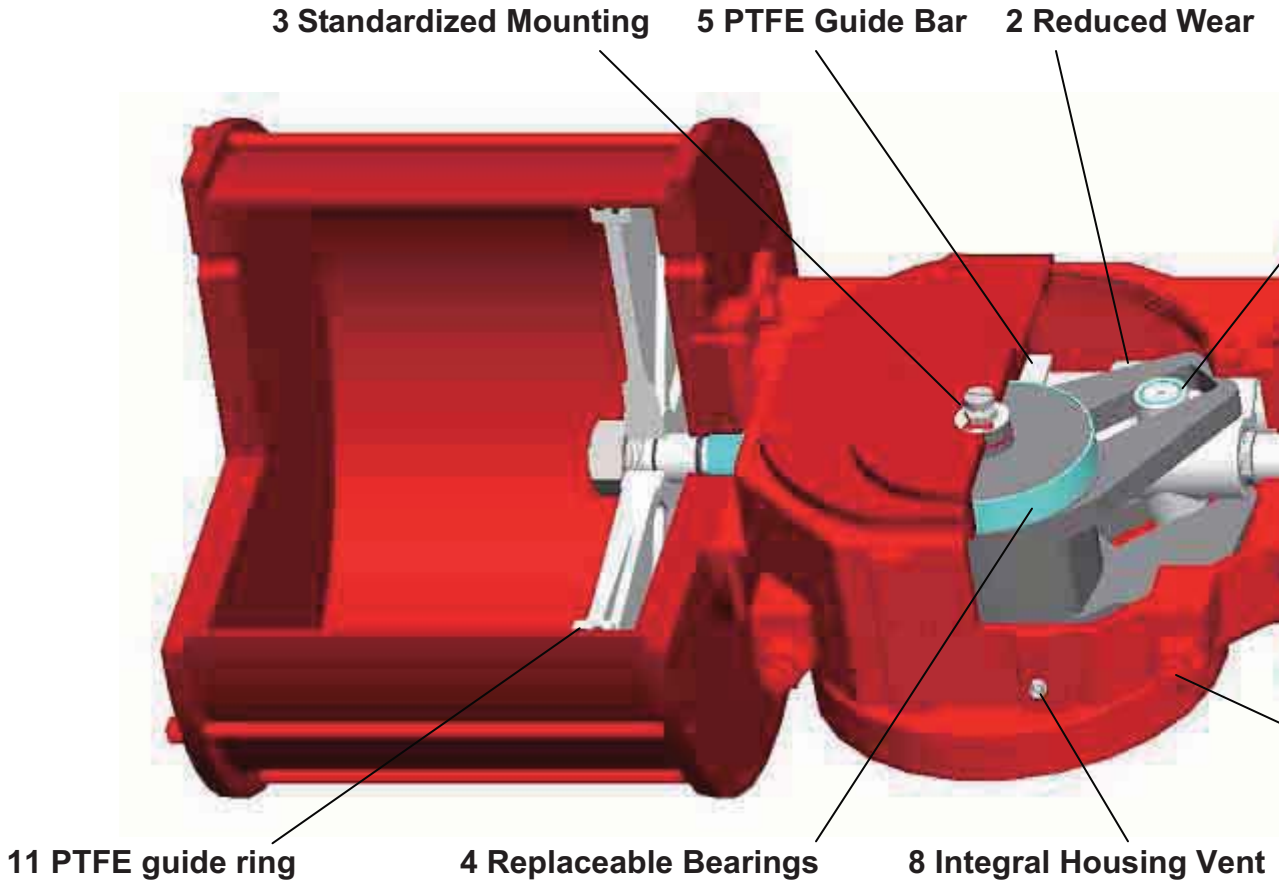
Design Features Offer Unique Benefits

1 Safe Spring Lock

Positively locks the spring module in place under load. This prevents spring module detachment from the drive module.

2 Reduced Wear

Connects the piston rod with the guide block, compensating for side load deflection and reducing wear on rod, bearings and seals.



3 Standardized Mounting

The NAMUR mounting configuration allows standardization of mounting hardware for a wide range of shaft driven accessories.

4 Replaceable Bearings

Replaceable bearings protect sliding and rotating components, with suitability for either dry or lubricated working conditions.

5 PTFE Guide Bar

PTFE thrust bar prevents yoke pin axial movement, transferring axial loads directly to the drive module case.

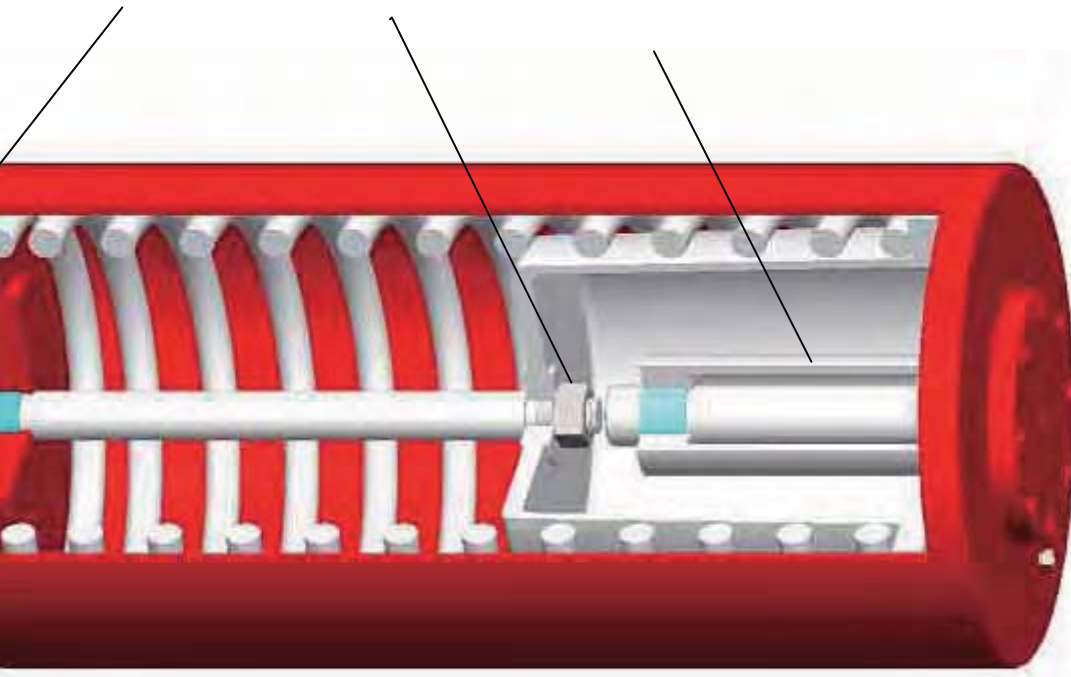
6 Hydraulic Overrides For Spring Module

Inside hydraulic override cylinder module for spring-return models doesn't increase actuator length.

7 Easy Lifting

NSF25 and larger models equipped with four lifting eyes for safe actuator handling during shipping installation and removal.

10 Roller 1 Safe Spring Lock 6 Hydraulic Overrides For Spring Module



9 80° to 100° Travel Adjustment

8 Integral Housing Vent

The main actuator housing incorporates an integral check valve in order to release overpressure while preventing ingress of foreign object or water

9 80° to 100° Travel Adjustment

Bi-directional travel stops integral to the actuator, the stops allow 80° to 100° total travel adjustment.

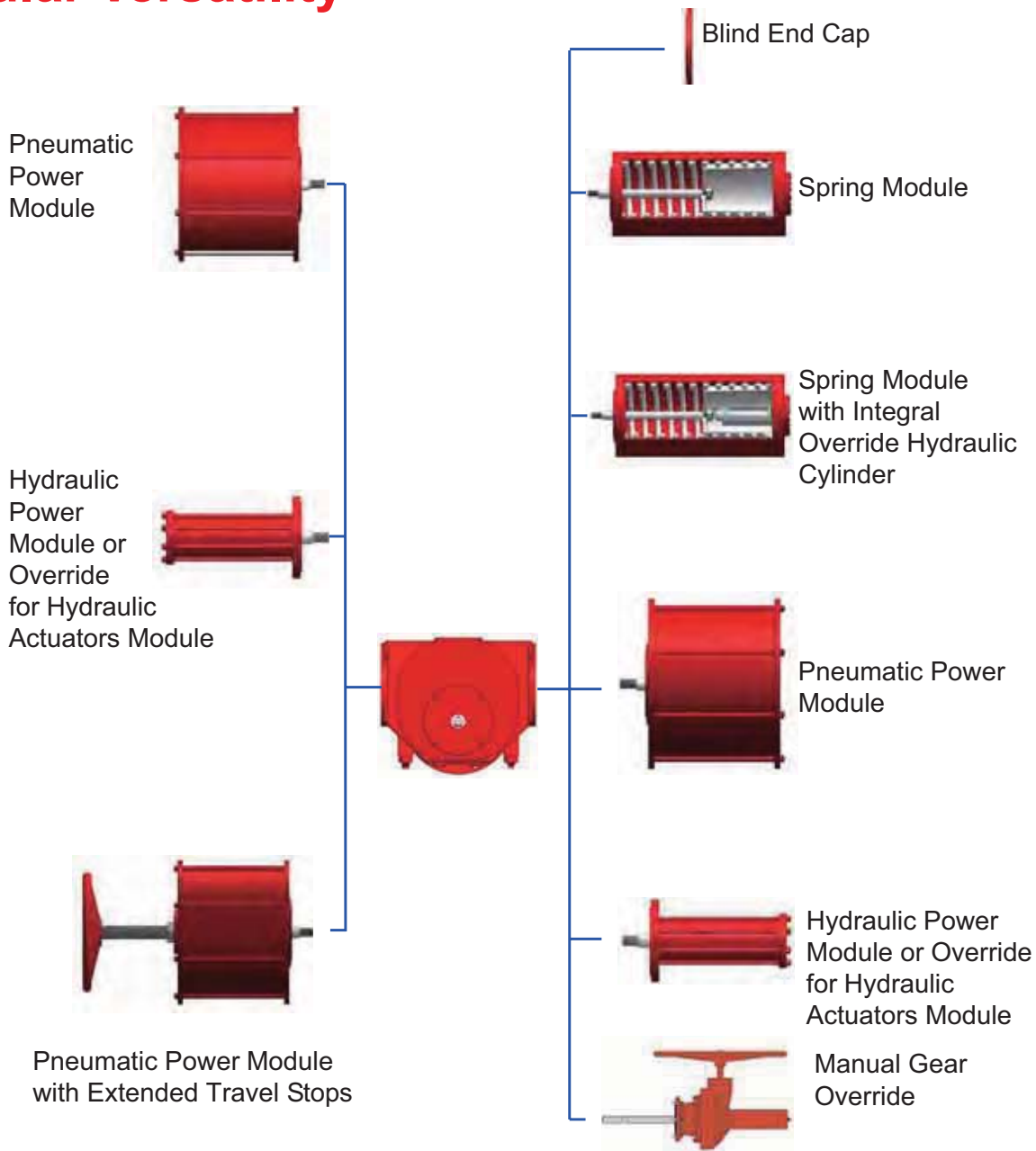
10 Roller

Rollers be used, reducing the friction between the yoke arm and pin, minimizing the wear of yoke arm and pin.

11 PTFE Guide Ring

Guide ring, made of PTFE, preventing metal to metal contact with the cylinder bore, project the cylinder not be scratched by pistons.

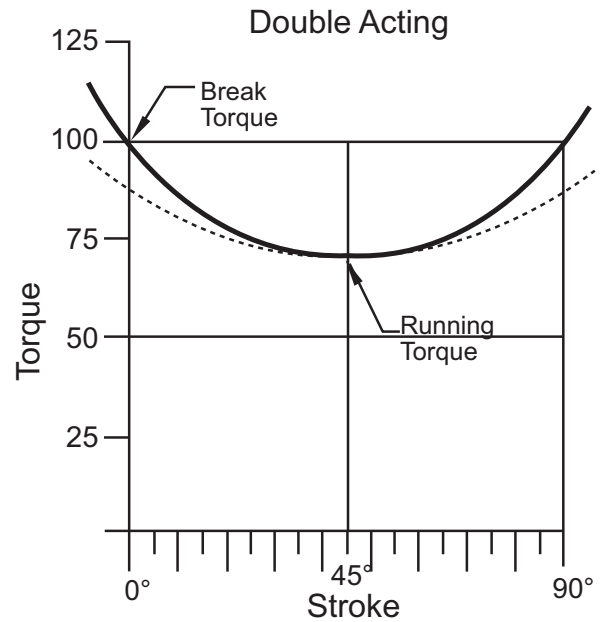
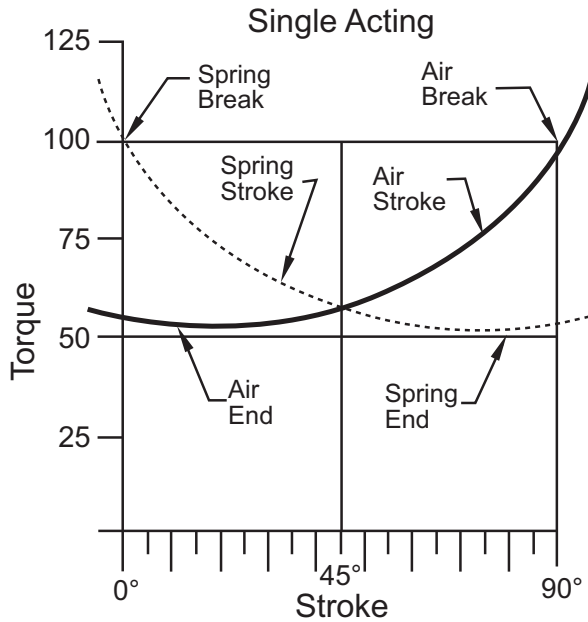
Modular Versatility



Torque Tester

We have developed a unique digital Torque Tester which enables us to accurately measure an actuator's torque output, thus NSF Series actuators can be supplied with a torque sheet, which details actual torque output throughout the actuator's travel range.

Torque Characteristics



Torque Table - Double Acting (Pneumatic Actuators)

Unit:Nm

Model	Max Torque of Drive Module	Air pressure									
		3bar		4bar		5bar		6bar		7bar	
		Start End	Run	Start End	Run	Start End	Run	Start End	Run	Start End	Run
NSF10-150-DA	500	302	181	402	242	503	302	604	363	----	----
NSF10-170-DA		391	247	522	313	652	391	----	----	----	----
NSF12-170-DA	1000	489	292	652	390	815	487	978	585	1141	683
NSF12-200-DA		681	408	908	545	1135	681	1362	817	1589	954
NSF14-200-DA	2000	830	504	1107	672	1384	839	1660	1007	1937	1175
NSF14-250-DA		1298	787	1730	1049	2163	1312	----	----	----	----
NSF14-300-DA		1861	1129	----	----	----	----	----	----	----	----
NSF16-250-DA	4000	1622	984	2163	1312	2704	1640	3245	1968	3786	2296
NSF16-300-DA		2336	1417	3115	1889	3894	2362	----	----	----	----
NSF16-350-DA		3180	1929	4240	2572	----	----	----	----	----	----
NSF25-350-DA	8000	3926	2381	5235	3175	6543	3969	7852	4763	----	----
NSF25-400-DA		4984	3023	6646	4031	8307	5039	----	----	----	----
NSF25-450-DA		6309	3827	8412	5103	----	----	----	----	----	----
NSF30-450-DA	16000	7710	4677	10280	6236	12850	7795	15420	9354	----	----
NSF30-500-DA		9519	5774	12693	7700	15866	9625	----	----	----	----
NSF30-550-DA		11519	6988	15359	9317	----	----	----	----	----	----
NSF35-550-DA	32000	14660	8893	19547	11858	24433	14822	29320	17787	34207	20752
NSF35-600-DA		17447	10584	23263	14112	29078	17640	34894	21169	----	----
NSF35-700-DA		23748	14407	31664	19209	----	----	----	----	----	----
NSF40-600-DA	63000	----	----	----	----	35310	21421	42373	25706	49435	29990
NSF40-700-DA		----	----	38449	23325	48062	29157	57674	34988	67286	40820
NSF40-800-DA		37664	30275	50219	40366	62774	50458	----	----	----	----
NSF48-800-DA	125000	----	----	----	----	73852	44803	88623	53764	103393	62725
NSF48-900-DA		----	----	74775	45363	93468	56703	112162	68044	130856	79385
NSF48-1000-DA		69237	42003	92316	56005	115395	70006	----	----	----	----
NSF60-800-DA	250000	----	----	----	----	----	----	119641	72582	139581	84679
NSF60-900-DA		----	----	100947	61241	126183	76551	151420	91861	176657	107171
NSF60-1000-DA		93469	56704	124626	75606	155782	94507	186939	113409	218095	132310
NSF60-1100-DA		113097	68612	150797	91483	188496	114354	226195	137229	263894	160095

Torque Sheet (Pneumatic Actuators)

Spring Return Acting (SR3 3Bar Spring for Air Pressure at 3Bar)

Nm

Model	Max Torque of Drive Module	Spring Start	Spring Running	Spring End	Air Start	Air Running	Air End
NSF10-150-SR3	500	187	91	118	183	89	115
NSF10-170-SR3		230	115	153	237	119	161
NSF12-170-SR3	1000	285	140	183	305	152	203
NSF12-200-SR3		384	189	246	434	219	297
NSF14-200-SR3	2000	511	254	307	523	261	318
NSF14-250-SR3		789	402	506	791	403	508
NSF14-300-SR3		1079	543	674	1194	615	790
NSF16-250-SR3		1092	508	607	1014	498	529
NSF16-300-SR3	4000	1434	721	892	1444	727	902
NSF16-350-SR3		1896	968	1227	1953	1038	1283
NSF25-350-SR3		2249	1153	1470	2346	1255	1567
NSF25-400-SR3	8000	2996	1516	1895	3089	1574	1903
NSF25-450-SR3		3960	2013	2534	3774	1898	2348
NSF30-450-SR3		4786	2379	2889	4821	2401	2924
NSF30-500-SR3	16000	6044	2969	3535	5984	2932	3475
NSF30-550-SR3		6867	3477	4349	7169	3664	4651
NSF35-550-SR3		9180	4520	5400	9260	4569	5480
NSF35-600-SR3	32000	11016	5392	6378	11069	5425	6430
NSF35-700-SR3		14449	7240	8907	14840	7483	9298
NSF40-600-SR3		13131	6586	8114	13071	6549	8054
NSF40-700-SR3	63000	16359	8256	10272	18564	9623	12477
NSF40-800-SR3		21426	10879	13666	23998	12460	16238
NSF48-800-SR3		26619	13330	16381	27930	14142	17691
NSF48-900-SR3	125000	33844	16948	20827	35254	17822	22237
NSF48-1000-SR3		45789	23215	29097	40140	19712	23447
NSF60-800-SR3		36800	18478	22805	35799	18379	21805
NSF60-900-SR3	250000	47118	23238	27842	47867	23702	28592
NSF60-1000-SR3		63398	31514	28261	55207	26436	30071
NSF60-1100-SR3		78878	34854	49217	63881	35266	34219

Spring Return Acting (SR4 4Bar Spring for Air Pressure at 4Bar)

Nm

Model	Max Torque of Drive Module	Spring Start	Spring Running	Spring End	Air Start	Air Running	Air End
NSF10-150-SR4	500	230	115	153	250	127	173
NSF10-170-SR4		293	148	201	320	164	228
NSF12-170-SR4	1000	384	189	246	405	202	268
NSF12-200-SR4		560	278	367	541	267	348
NSF14-200-SR4	2000	679	346	436	671	341	428
NSF14-250-SR4		1079	543	674	1056	530	651
NSF14-300-SR4		1477	752	948	1544	793	1015
NSF16-250-SR4		1281	651	818	1345	691	882
NSF16-300-SR4	4000	1896	968	1227	1888	963	1219
NSF16-350-SR4		2595	1319	1629	2611	1327	1645
NSF25-350-SR4		2996	1517	1895	3193	1706	2092
NSF25-400-SR4	8000	3960	2013	2534	4112	2107	2686
NSF25-450-SR4		4955	2466	2999	5412	2749	3456
NSF30-450-SR4		6329	3146	3820	6461	3228	3952
NSF30-500-SR4	16000	7929	3967	4869	7824	3902	4763
NSF30-550-SR4		9375	4814	5824	9534	4708	5983
NSF35-550-SR4		12297	6131	7481	12066	5988	7250
NSF35-600-SR4	32000	14449	7241	8907	14356	7183	8813
NSF35-700-SR4		19069	9491	11549	20114	10140	12594
NSF40-600-SR4		16359	8926	10272	17976	8256	11888
NSF40-700-SR4	63000	21426	10879	13666	24782	12960	17023
NSF40-800-SR4		30015	15120	18757	31461	16016	20203
NSF48-800-SR4		33844	16948	20827	38254	19417	25237
NSF48-900-SR4	125000	45789	23344	29097	45677	23146	28986
NSF48-1000-SR4		57348	28690	35200	57115	28546	34968
NSF60-800-SR4		47118	23238	27842	51918	26214	32642
NSF60-900-SR4	250000	63398	31514	38261	62685	31072	37548
NSF60-1000-SR4		78878	39048	49217	75409	38220	45747
NSF60-1100-SR4		95891	47761	58177	92620	45733	54906

Torque Sheet (Pneumatic Actuators)

Spring Return Acting (SR5 5Bar Spring for Air Pressure at 5bar)

Nm

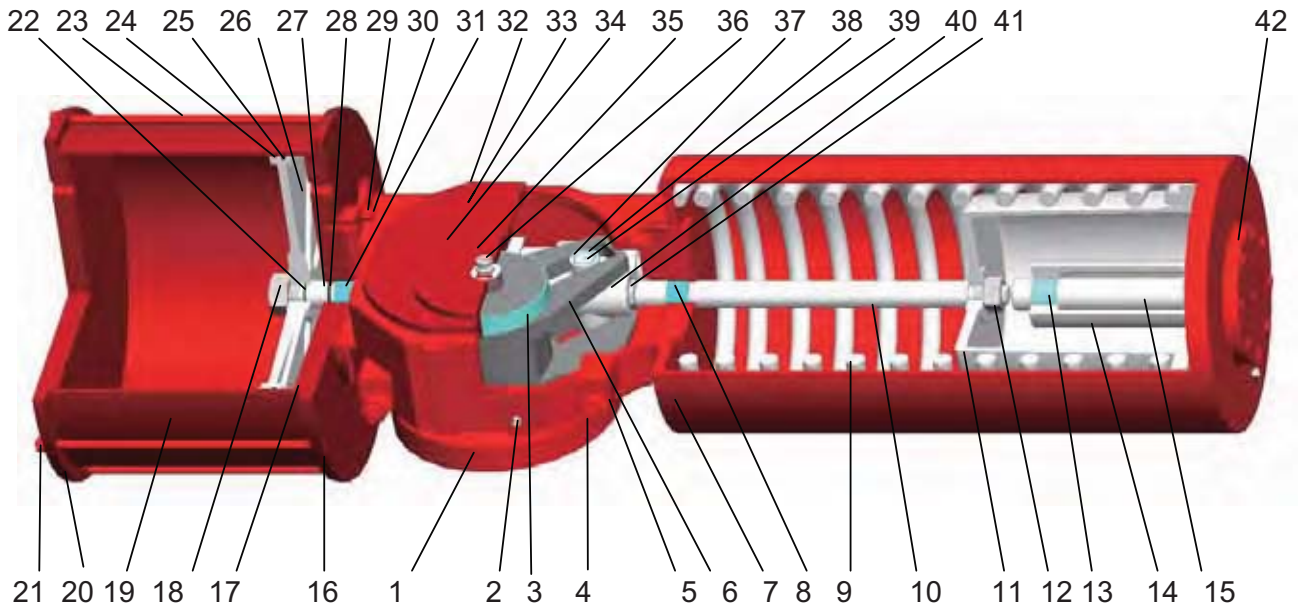
Model	Max Torque of Drive Module	Spring Start	Spring Running	Spring End	Air Start	Air Running	Air End
NSF10-150-SR5	500	293	148	201	303	154	211
NSF10-170-SR5		383	193	260	391	198	269
NSF12-170-SR5	1000	485	243	326	489	245	330
NSF12-200-SR5		692	343	453	682	337	442
NSF14-200-SR5	2000	789	402	506	877	456	594
NSF14-250-SR5		1345	670	815	1347	671	818
NSF14-300-SR5		1880	957	1206	1908	975	1235
NSF16-250-SR5		4000	1553	795	1011	1692	881
NSF16-300-SR5	2421		1202	1455	2438	1213	1472
NSF16-350-SR5	3194		1637	2085	3215	1744	2106
NSF25-350-SR5	8000	3960	2013	2534	3826	2044	2400
NSF25-400-SR5		4955	2466	2999	5309	2685	3352
NSF25-450-SR5		6326	3117	3726	6788	3402	4188
NSF30-450-SR5	16000	7929	3968	4869	7892	4001	4922
NSF30-500-SR5		9375	4712	5824	10042	5125	6490
NSF30-550-SR5		11426	5741	7092	12106	6162	7772
NSF35-550-SR5	32000	14449	7241	8907	15527	7909	9984
NSF35-600-SR5		18185	8971	10752	18327	9058	10894
NSF35-700-SR5		23864	11772	14109	25470	12767	15715
NSF40-600-SR5	63000	21426	10879	13666	21644	11014	13884
NSF40-700-SR5		30015	15120	18757	29304	14679	18046
NSF40-800-SR5		35425	17702	21679	41095	21218	27349
NSF48-800-SR5	125000	45789	23214	29097	44755	22574	28063
NSF48-900-SR5		57348	28690	35200	58269	29261	36121
NSF48-1000-SR5		69602	34789	42618	72776	36756	45792
NSF60-800-SR5	250000	63398	31515	38261	61439	30300	36302
NSF60-900-SR5		78878	39710	49217	76967	38524	47305
NSF60-1000-SR5		95891	47761	58177	97605	48824	59891
NSF60-1100-SR5		112369	57081	71764	116733	59787	76127

Spring Return Acting (SR6 6Bar Spring for Air Pressure at 6bar)

Nm

Model	Max Torque of Drive Module	Spring Start	Spring Running	Spring End	Air Start	Air Running	Air End
NSF10-150-SR6	500	383	193	260	345	170	222
NSF10-170-SR6		489	242	319	463	227	293
NSF12-170-SR6	1000	560	278	367	611	309	418
NSF12-200-SR6		822	408	539	824	409	540
NSF14-200-SR6	2000	1028	512	623	1037	518	633
NSF14-250-SR6		1477	752	948	1648	857	1118
NSF14-300-SR6		2291	1162	1458	2280	1156	1447
NSF16-250-SR6	4000	1896	968	1227	2018	1043	1348
NSF16-300-SR6		2595	1310	1629	3044	1588	2077
NSF16-350-SR6		3858	1954	2446	3914	2102	2502
NSF25-350-SR6	8000	4955	2466	2999	4633	2403	2677
NSF25-400-SR6		6326	3117	3726	6243	3065	3643
NSF25-450-SR6		8261	4024	4720	7897	3799	4357
NSF30-450-SR6	16000	9375	4712	5824	9598	4850	6046
NSF30-500-SR6		11426	5741	7092	11962	6064	7613
NSF30-550-SR6		14080	6952	8344	14694	7332	8957
NSF35-550-SR6	32000	18185	8970	10752	18569	9209	11136
NSF35-600-SR6		22471	10908	12716	22179	10727	12424
NSF35-700-SR6		28953	14335	17288	30207	15112	18543
NSF40-600-SR6	63000	26630	13472	16828	25544	12799	15471
NSF40-700-SR6		35425	17702	21679	35995	18056	22248
NSF40-800-SR6		47742	23883	29300	46029	22821	28593
NSF48-800-SR6	125000	57348	28690	35200	53420	26257	31275
NSF48-900-SR6		69602	34788	42618	69545	34753	42561
NSF48-1000-SR6		82680	41743	51976	86497	42250	55793
NSF60-800-SR6	250000	78878	39710	49217	70724	34468	40762
NSF60-900-SR6		95891	47761	58177	93243	46119	55529
NSF60-1000-SR6		112369	57081	71764	115175	58821	74570
NSF60-1100-SR6		----	----	----	----	----	----

Assembly Drawing & Parts List (Pneumatic Actuators)

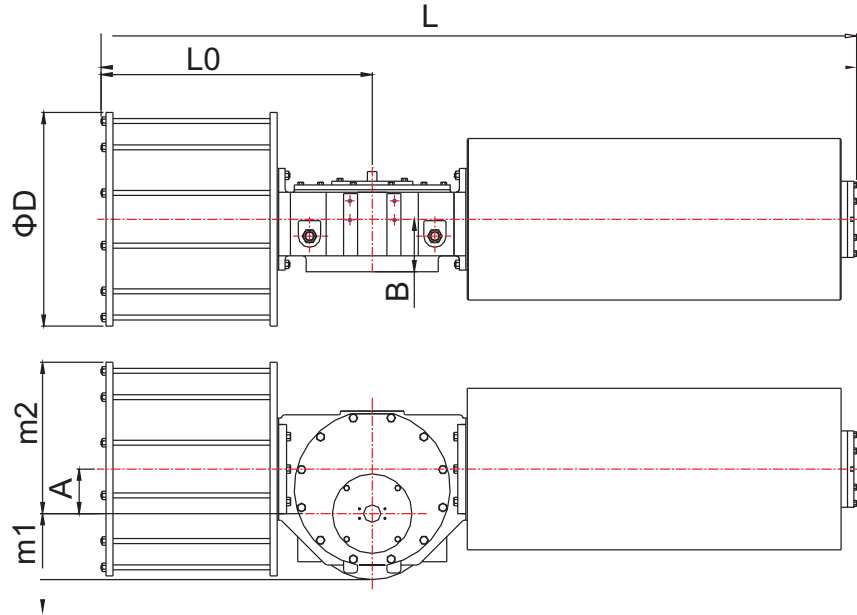


No.	Name	Material	No.	Name	Material
1	Body	Ductile Iron	22	O-Ring	NBR
2	Vent Valve	Carbon Steel	23	Screw	Alloy Steel
3	Sliding Bearing	Metal + TFE	24	Guide Ring	PTFE
4	Adjust Stud	Alloy Steel	25	O-Ring	NBR
5	Nut	2H	26	Piston	Ductile Iron
6	Yoke	Carbon Steel	27	Center Bar	Alloy Steel
7	Spring Case	Carbon Steel	28	O-Ring	NBR
8	Sliding Bearing	Metal + TFE	29	Stud	Alloy Steel
9	Spring	Alloy Steel	30	Nut	2H
10	Tension rod	Alloy Steel	31	Sliding Bearing	Metal + TFE
11	Spring Seat	Carbon Steel	32	Bolt	Carbon Steel
12	Nut	2H	33	Body Cap	Ductile Iron
13	Sliding Bearing	Metal + TFE	34	Bolt	Carbon Steel
14	Hydraulic Cylinder	Carbon Steel	35	Cover	Ductile Iron
15	Hydraulic Piston	Carbon Steel	36	Drive Shaft	Alloy Steel
16	Adapter	Ductile Iron	37	Roller	Alloy Steel
17	O-Ring	NBR	38	Sliding Bearing	Metal + TFE
18	Nut	2H	39	Pin	Alloy Steel
19	Cylinder	Carbon Steel	40	Guide Block	Ductile Iron
20	End Cap	Ductile Iron	41	Nut	Carbon Steel
21	Nut	2H	42	Cover Plate	Carbon Steel

Dimension

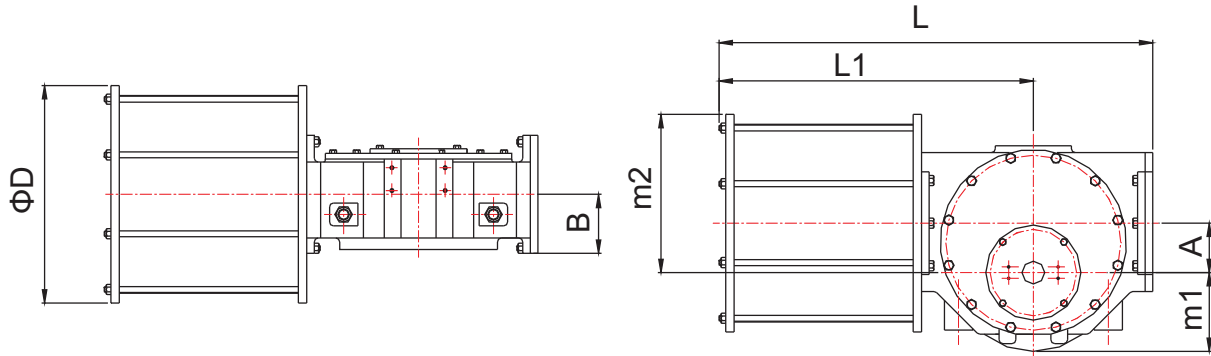
Spring Return Acting (Pneumatic Actuators)

Dimensions in this sheet only for the spring return actuators which spring size is 4Bar, Others please contact with our technology department.



Model	Connect Flange	L	L0	m1	m2	A	B	D	Pressure Port	Weight (kg)
NSF10-150-SR4	F10	800	335	75	143.5	40	82	207	1/4"	70
NSF10-170-SR4		800	335	75	155.5	40	82	231	3/8"	80
NSF12-170-SR4	F12	962	364	65	165	50	80	230	3/8"	79
NSF12-200-SR4		962	364	78	178	50	80	256	3/8"	93
NSF14-200-SR4	F14	1105	449	87.5	187.5	60	88	255	3/8"	117
NSF14-250-SR4		1105	449	87.5	212.5	60	88	305	1/2"	156
NSF14-300-SR4		1125	449	87.5	237.5	60	88	355	1/2"	182
NSF16-250-SR4	F16	1289	499	105	222.5	70	92	305	1/2"	184
NSF16-300-SR4		1289	499	105	247.5	70	92	355	1/2"	209
NSF16-350-SR4		1318	499	105	272.5	70	92	405	1/2"	268
NSF25-350-SR4	F25	1576	556	150	292.5	90	104	405	1/2"	316
NSF25-400-SR4		1576	556	150	317.5	90	104	455	3/4"	355
NSF25-450-SR4		1674	556	150	350	90	104	520	3/4"	386
NSF30-450-SR4	F30	1807	662	175	370	110	130	520	3/4"	534
NSF30-500-SR4		1807	662	175	395	110	130	570	3/4"	609
NSF30-550-SR4		1807	662	175	420	110	130	620	3/4"	758
NSF35-550-SR4	F35	2005	817	207.5	450	140	165	620	3/4"	997
NSF35-600-SR4		2005	817	207.5	450	140	165	670	1"	1102
NSF35-700-SR4		2005	817	207.5	475	140	165	770	1"	1310
NSF40-600-SR4	F40	2695	960	237.5	505	170	200	670	1"	1230
NSF40-700-SR4		2695	960	237.5	555	170	200	770	1"	1420
NSF40-800-SR4		2695	960	237.5	607.5	170	200	875	1.1/2"	1865
NSF48-800-SR4	F48	3395	1130	280	637.5	200	210	875	1.1/2"	2340
NSF48-900-SR4		3395	1130	280	687.5	200	210	975	2"	2816
NSF48-1000-SR4		3585	1130	280	787.5	200	210	1075	2"	3380
NSF60-800-SR4	F60	4185	1380	343	707.5	270	230	875	1.1/2"	3170
NSF60-900-SR4		4185	1380	343	757.5	270	230	975	2"	3718
NSF60-1000-SR4		4750	1380	343	807.5	270	230	1075	2"	4230
NSF60-1100-SR4		4750	1380	343	857.5	270	230	1175	2"	4940

Dimension- Double Acting (Pneumatic Actuators)



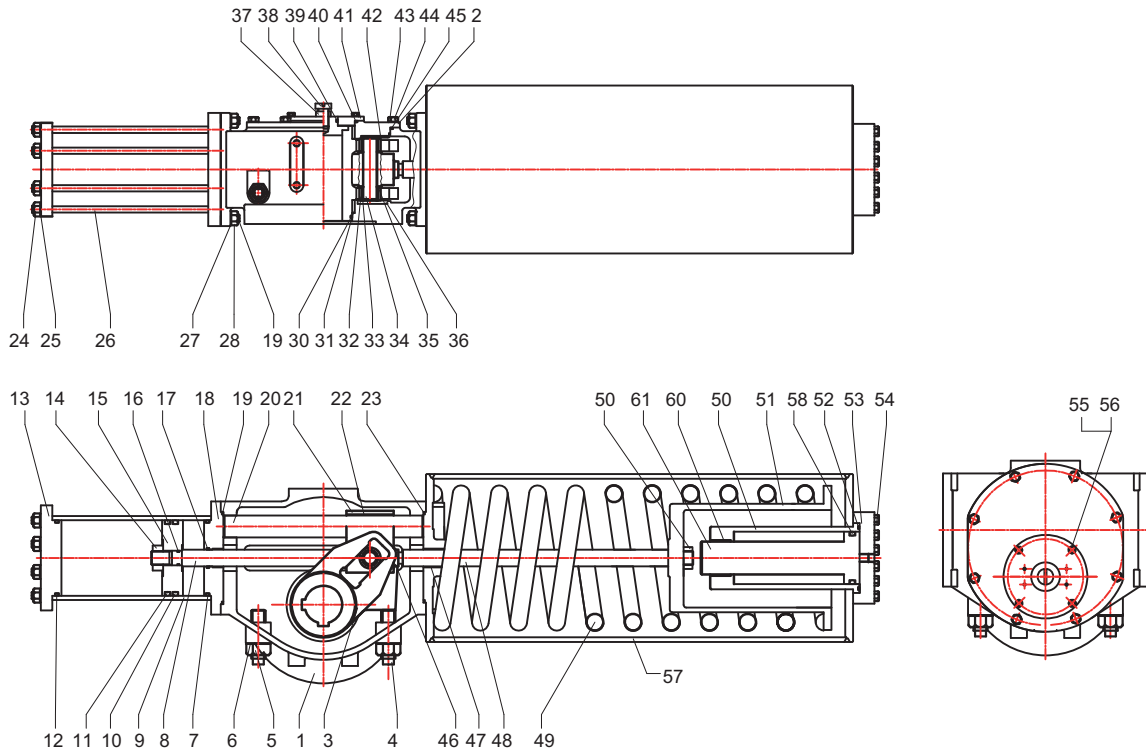
Model	Connect Flange	L	L1	m1	m2	A	B	D	Pressure Port	(kg)
NSF10-150-DA	F10	459	335	75	143.5	40	82	207	1/4"	39
NSF10-170-DA		459	335	75	155.5	40	82	231	3/8"	40
NSF12-170-DA	F12	499	364	73	165	50	80	230	3/8"	41
NSF12-200-DA		499	364	73	178	50	80	256	3/8"	48
NSF14-200-DA	F14	594	449	87.5	187.5	60	88	255	3/8"	57
NSF14-250-DA		594	449	87.5	212.5	60	88	305	1/2"	69
NSF14-300-DA		594	449	87.5	237.5	60	88	355	1/2"	87
NSF16-250-DA	F16	679	499	105	222.5	70	92	305	1/2"	89
NSF16-300-DA		679	499	105	247.5	70	92	355	1/2"	108
NSF16-350-DA		679	499	105	272.5	70	92	405	1/2"	129
NSF25-350-DA	F25	766	556	150	292.5	90	104	405	1/2"	158
NSF25-400-DA		766	556	150	317.5	90	104	455	3/4"	202
NSF25-450-DA		766	556	150	350	90	104	520	3/4"	223
NSF30-450-DA	F30	922	662	175	370	110	130	520	3/4"	285
NSF30-500-DA		922	662	175	395	110	130	570	3/4"	325
NSF30-550-DA		922	662	175	420	110	130	620	3/4"	351
NSF35-550-DA	F35	1130	817	207.5	450	140	165	620	3/4"	427
NSF35-600-DA		1130	817	207.5	450	140	165	670	1"	463
NSF35-700-DA		1130	817	207.5	475	140	165	770	1"	542
NSF40-600-DA	F40	1320	960	237.5	505	170	200	670	1"	636
NSF40-700-DA		1320	960	237.5	555	170	200	770	1"	723
NSF40-800-DA		1320	960	237.5	607.5	170	200	875	1.1/2"	842
NSF48-800-DA	F48	1580	1130	280	637.5	200	210	875	1.1/2"	1073
NSF48-900-DA		1580	1130	280	687.5	200	210	975	2"	1335
NSF48-1000-DA		1580	1130	280	787.5	200	210	1075	2"	1560
NSF60-800-DA	F60	1960	1380	343	707.5	270	230	875	1.1/2"	1685
NSF60-900-DA		1960	1380	343	757.5	270	230	975	2"	1970
NSF60-1000-DA		1960	1380	343	807.5	270	230	1075	2"	2210
NSF60-1100-DA		1960	1380	343	857.5	270	230	1175	2"	2510

Order Information

NSF30 — 500 — DA — 4 — 1 — HW — FC

1. Actuator Size : NSF10 ~ NSF60
2. Cylinder Size : 150 ~ 1100
3. Actuator Type : DA - Double Acting Type
SR - Single Acting Type
4. Spring Size : 3 - 3bar, 4 - 4bar, 5 - 5bar, 6 - 6bar
5. Seal Material : 0 - NBR Seal
1 - HNBR Seal(Low Temperature)
2 - Viton Seal(High Temperature)
6. Accessories : HW - Jack Screw Manual Override
EX - Extend Travel Stop
HY - Hydraulic Manual Override
7. Failure Position(Single Acting Type Only) :
FC - Failure Close , FO - Failure Open

Assembly Drawing & Parts List (Hydraulic Actuators)



No.	Name	Material	No.	Name	Material
1	Body	QT450-10	32	Roller	35CrMo
2	Body End	QT450-10	33	Sliding Bearing	Composite Bearing
3	Yoke	QT450-10	34	Pin	35CrMo
4	Adjust Stud	35CrMo	35	Thrust Bearing	PTFE
5	Nut	2H	36	Guide Ring	PTFE
6	Washer	Carbon Steel+NBR	37	Nut	304
7	O-Ring	NBR or Silicone Rubber	38	On/Off Indicator	304
8	Piston Rob	35CrMo	39	O-Ring	NBR or Silicone Rubber
9	Hydraulic Cylinder	Carbon Steel	40	O-Ring	NBR or Silicone Rubber
10	O-Ring	NBR or Silicone Rubber	41	Cover	QT450-10
11	Guide Ring	PTFE	42	Guide Ring	PTFE
12	O-Ring	NBR or Silicone Rubber	43	Spring Washer	65Mn
13	End Cap	Carbon Steel	44	Bolt	35
14	Nut	Carbon Steel	45	O-Ring	NBR or Silicone Rubber
15	Piston	QT450-10	46	Nut	35CrMo
16&17	O-Ring	NBR or Silicone Rubber	47	Sliding Bearing	Composite Bearing
18	Adapter	Carbon Steel	48	Piston Rod	35CrMo
19	O-Ring	NBR or Silicone Rubber	49	Spring	60Si2Mn
20	Guide Rob	35CrMo	50	Nut	45
21	Guide Block	WCB	51	Spring Seat	Q235
22	Sliding Bearing	Composite Bearing	52	O-Ring	NBR or Silicone Rubber
23	O-Ring	NBR or Silicone Rubber	53	Spring Case Cover	QT450-10
24	Nut	2H	54	Bolt	35
25	Spring Washer	Spring Steel	55	Spring Washer	65Mn
26	Stud	35CrMo	56	Bolt	65CrMn
27	Spring Washer	Spring Steel	57	Spring Case	20
28	Nut	2H	58	O-Ring	NBR or Silicone Rubber
29	Bolt	35	59	Manual Hydraulic Clinder	20
30	O-Ring	NBR or Silicone Rubber	60	Sliding Bearing	Composite bearing
31	Bearing	Cu	61	Piston Of Manual Hydraulic Case	20

Torque Table - Double Acting (Hydraulic Actuators)

Nm

Model	Max Torque of Drive Module	Oil Pressure					
		70BAR		100BAR		135BAR	
		Start / End	Run	Start / End	Run	Start / End	Run
NSF10-40DA-H	500	315	189	450	270	607	364
NSF12-40DA-H	1000	393	236	562	337	758	455
NSF12-50DA-H		756	454	1081	649	----	----
NSF14-60DA-H	2000	1364	818	1949	1169	2631	1578
NSF14-70DA-H		1994	1196	2849	1709	----	----
NSF16-70DA-H	4000	2347	1408	3354	2912	4527	2716
NSF16-80DA-H		3256	1953	4652	2791	----	----
NSF25-90DA-H	8000	4838	2902	6912	4147	9331	5598
NSF25-100DA-H		6219	3871	8885	5331	----	----
NSF25-110DA-H		7746	4648	----	----	----	----
NSF30-110DA-H	16000	8951	5371	12788	7673	17263	10358
NSF30-120DA-H		10995	6596	15708	9424	21205	12722
NSF30-130DA-H		13216	7929	18881	11328	----	----
NSF35-130DA-H	32000	15690	9414	22415	13449	30260	18156
NSF35-150DA-H		22023	13213	31462	18877	----	----
NSF35-170DA-H		29261	17556	----	----	----	----
NSF40-170DA-H	63000	32956	19773	47081	28248	63559	38135
NSF40-190DA-H		42843	25706	61205	36723	----	----
NSF40-220DA-H		59734	35840	----	----	----	----
NSF48-190DA-H	125000	49233	29539	70333	42199	94949	56969
NSF48-220DA-H		69104	41462	98720	59232	133272	79963
NSF48-245DA-H		87884	52730	125549	75329	----	----
NSF48-270DA-H		108684	65210	----	----	----	----
NSF60-245DA-H	250000	113246	67947	161780	97068	218403	131041
NSF60-270DA-H		141326	84795	201895	121136	272558	163533
NSF60-320DA-H		205664	1223398	293807	176284	----	----

Torque Table - Spring Return Acting (Oil Pressure at 70Bar)

Nm

Model	Max Torque of Drive Module	Spring Break	Spring Running	Spring End	Oil Start	Oil Running	Oil End
NSF10-40SR1-H	500	187	91	118	196	97	127
NSF10-50SR2-H		293	148	201	404	214	312
NSF10-60SR3-H		489	242	319	641	333	471
NSF12-60SR1-H	1000	526	267	364	747	374	501
NSF12-70SR2-H		818	407	541	1185	628	907
NSF14-70SR1-H	2000	1079	543	674	1321	682	953
NSF14-70SR2-H		1477	752	948	1765	902	1243
NSF14-100SR3-H		2291	1162	1458	2976	1530	2125
NSF16-90SR1-H	4000	2595	1310	1629	2622	1285	1662
NSF16-100SR2-H		3194	1637	2085	3313	1629	2117
NSF16-110SR3-H		3858	1954	2446	4224	2101	2781
NSF25-110SR1-H	8000	4955	2466	2999	4865	2447	2913
NSF25-120SR2-H		6326	3117	3726	5648	2735	3469
NSF25-140SR3-H		7628	3750	4720	8325	4168	5571
NSF30-140SR1-H	16000	9375	4712	5824	9916	4843	6228
NSF30-150SR2-H		11426	5741	7092	10931	5226	6489
NSF30-170SR3-H		14080	6952	8344	15343	7723	10403
NSF35-170SR1-H	32000	18185	8970	10752	18430	9261	12440
NSF35-190SR2-H		23864	11772	14109	23947	12048	16215
NSF35-220SR3-H		28953	14335	17288	33278	16764	22601
NSF40-220SR1-H	63000	35425	17702	21679	37799	18605	24218
NSF40-245SR2-H		47742	23883	29300	48480	23583	30131
NSF48-245SR1-H	125000	57348	28690	35200	53961	25592	31346
NSF48-270SR2-H		69602	34788	42618	64371	31211	39668
NSF48-290SR3-H		82680	41743	51976	73638	35219	43760
NSF60-270SR1-H	250000	95891	47761	58177	86201	41893	53442
NSF60-320SR2-H		112369	57081	71764	133547	67250	90620

Torque Table - Spring Return Acting(Oil Pressure at 100Bar)

Nm

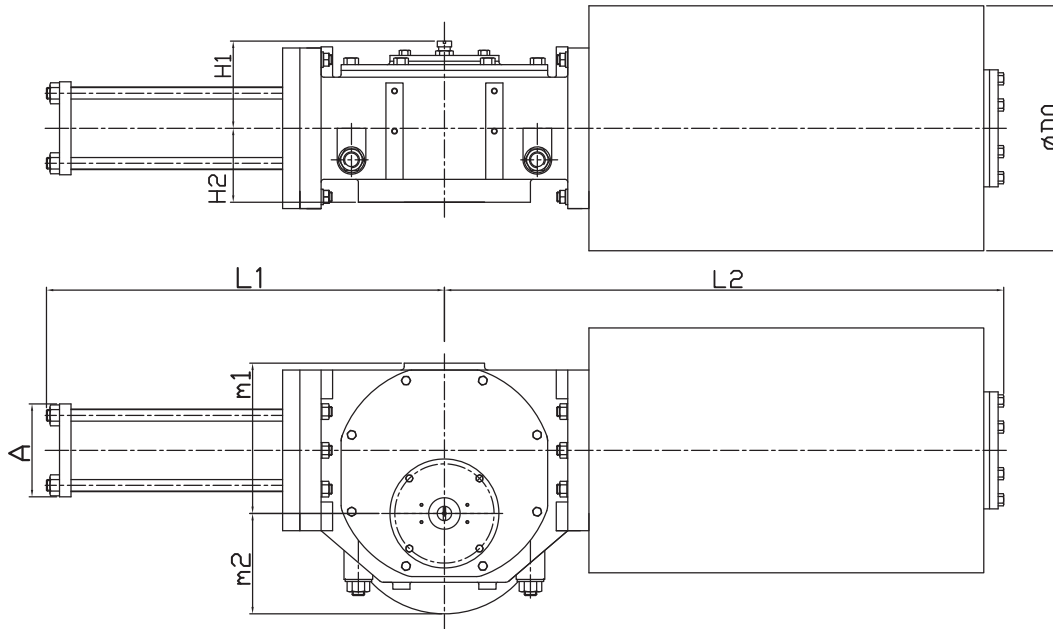
Model	Max Torque of Drive Module	Spring Break	Spring Running	Spring End	Oil Start	Oil Running	Oil End
NSF10-40SR1-H	500	187	91	118	331	178	262
NSF10-50SR2-H		293	148	201	664	370	571
NSF10-50SR3-H		489	242	319	545	276	375
NSF12-60SR1-H	1000	526	267	364	1262	683	1016
NSF12-60SR2-H		818	407	541	1175	621	897
NSF14-60SR1-H	2000	1079	543	674	1276	655	907
NSF14-70SR2-H		1477	752	948	1893	979	1371
NSF14-80SR3-H		2291	1162	1458	2397	1183	1547
NSF16-80SR1-H	4000	2595	1310	1629	2988	1505	2028
NSF16-90SR2-H		3194	1637	2085	3999	2041	2804
NSF16-100SR3-H		3858	1954	2446	5284	2736	3839
NSF25-100SR1-H	8000	4955	2466	2999	5994	3081	4275
NSF25-110SR2-H		6326	3117	3726	7296	3724	5117
NSF25-120SR3-H		7628	3750	4720	8581	4322	5827
NSF30-120SR1-H	16000	9375	4712	5824	10008	4898	6320
NSF30-130SR2-H		11426	5741	7092	11620	5639	7177
NSF30-150SR3-H		14080	6952	8344	17453	8990	12513
NSF35-150SR1-H	32000	18185	8970	10752	20631	10581	14641
NSF35-170SR2-H		23864	11772	14109	28345	14688	20614
NSF35-190SR3-H		28953	14335	17288	35399	18036	24722
NSF40-190SR1-H	63000	35425	17702	21679	39270	19488	25689
NSF40-220SR2-H		47742	23883	29300	58110	29365	39768
NSF48-220SR1-H		57348	28690	35200	64797	32094	42182
NSF48-245SR2-H	125000	69602	34788	42618	81236	41330	56533
NSF48-270SR3-H		82680	41743	51976	102123	52310	72245
NSF60-245SR1-H		95891	47761	58177	101957	51169	68609
NSF60-270SR2-H	250000	112369	57081	71764	129778	64988	89820

Torque Table - Spring Return Acting(Oil Pressure at 135Bar)

Nm

Model	Max Torque of Drive Module	Spring Break	Spring Running	Spring End	Oil Start	Oil Running	Oil End
NSF10-40SR1-H	500	187	91	118	488	272	420
NSF10-40SR2-H		293	148	201	406	216	308
NSF10-50SR3-H		489	242	319	848	458	678
NSF12-50SR1-H	1000	526	267	364	1006	346	760
NSF12-50SR2-H		818	407	541	919	468	641
NSF14-60SR1-H	2000	1079	543	674	1958	1064	1591
NSF14-60SR2-H		1477	752	948	1675	848	1154
NSF14-70SR3-H		2291	1162	1458	2356	1158	1506
NSF16-70SR1-H	4000	2595	1310	1629	2864	2105	1904
NSF16-80SR2-H		3194	1637	2085	4156	2135	2961
NSF16-80SR3-H		3858	1954	2446	3795	1844	2352
NSF25-90SR1-H	8000	4955	2466	2999	6440	3348	4721
NSF25-100SR2-H		6326	3117	3726	8225	4281	6046
NSF25-100SR3-H		7628	3750	4720	7122	3447	4367
NSF30-110SR1-H	16000	9375	4712	5824	11564	5832	7876
NSF30-120SR2-H		11426	5741	7092	13944	7034	9502
NSF30-130SR3-H		14080	6952	8344	16953	8690	12013
NSF35-130SR1-H	32000	18185	8970	10752	19429	9860	13440
NSF35-150SR2-H		23864	11772	14109	29018	15091	21286
NSF35-170SR3-H		28953	14335	17288	38398	19835	27721
NSF40-170SR1-H	63000	35425	17702	21679	41624	20900	28043
NSF40-190SR2-H		47742	23883	29300	55410	27741	37061
NSF48-190SR1-H		57348	28690	35200	61026	29831	38411
NSF48-220SR2-H	125000	69602	34788	42618	88958	45964	64256
NSF48-245SR3-H		82680	41743	51976	116351	60847	86473
NSF60-220SR1-H		95891	47761	58177	114382	58802	81624
NSF60-245SR2-H	250000	112369	57081	71764	146287	74894	103360

Dimension- Spring Return Acting (Hydraulic Actuators)

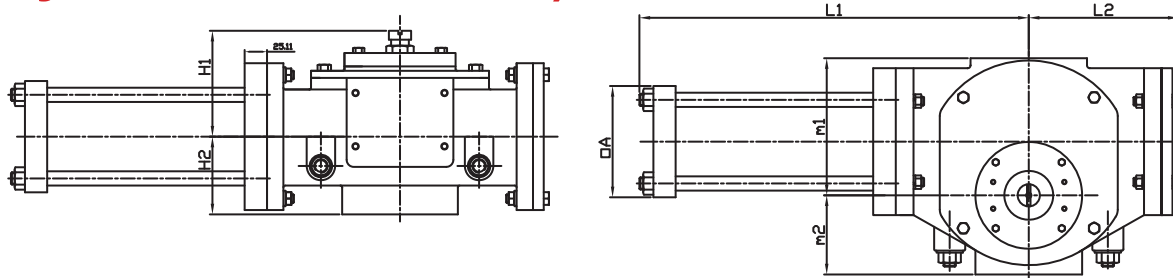


Unit:mm

Unit:mm

Model	Connect Flange	L1	L2	H1	H2	D0	A	m1	m2	Pressure Port	Model	Connect Flange	L1	L2	H1	H2	D0	A	m1	m2	Pressure Port														
NSF10-40SR1-H	F10	345	465	102	82	168	85	82	123	1/4"	NSF30-110SR1-H	F30	730	1165	163	139	426	155	175	262	3/8"														
NSF10-50SR2-H						168	92			426	170						3/8"																		
NSF10-60SR3-H						219	100			426	185						3/8"																		
NSF12-50SR1-H	F12	398	515	105	85	219	100	87	143	1/4"	NSF30-120SR2-H	F35	855	1511	180	177	508	170	207.5	320	3/8"														
NSF12-60SR1-H						219	100			508	180						3/8"																		
NSF12-50SR2-H						273	92			508	195						3/8"																		
NSF12-60SR2-H						273	100			508	180						3/8"																		
NSF12-70SR2-H	F14	455	619	114	87	273	110	89	155	1/4"	NSF30-150SR3-H	F40	990	1760	202	190	508	195	238	377	3/8"														
NSF14-60SR1-H						273	100			508	270						1/2"																		
NSF14-70SR1-H						273	110			508	180						3/8"																		
NSF14-60SR2-H						273	100			508	195						3/8"																		
NSF14-70SR2-H						273	110			508	270						1/2"																		
NSF14-70SR3-H						325	110			630	195						3/8"																		
NSF14-80SR3-H						325	130			630	270						1/2"																		
NSF14-100SR3-H						325	145			630	290						1/2"																		
NSF16-70SR1-H						F16	530			775	119						98	273			110	105	180	1/4"	NSF35-170SR3-H	F48	1150	2305	238	227	630	270	280	450	1/2"
NSF16-80SR1-H																		273			130			630	290						1/2"				
NSF16-90SR1-H	273	138	630	320	1/2"																														
NSF16-80SR2-H	325	130	630	270	1/2"																														
NSF16-90SR2-H	325	138	630	290	1/2"																														
NSF16-100SR2-H	325	145	630	320	1/2"																														
NSF16-80SR3-H	325	130	730	290	1/2"																														
NSF16-100SR3-H	325	145	730	320	1/2"																														
NSF16-110SR3-H	273	155	730	345	1/2"																														
NSF25-90SR1-H	F25	610	940	138	122			325	110			150	222	3/8"	NSF48-190SR1-H	F60		1420	3100	240	225			730	290						343	545			1/2"
NSF25-100SR1-H								325	130					730	320									1/2"											
NSF25-110SR1-H								325	138					730	345									1/2"											
NSF25-100SR2-H						377	130	730	320	1/2"																									
NSF25-110SR2-H						377	138	730	345	1/2"																									
NSF25-120SR2-H						377	145	730	370	1/2"																									
NSF25-100SR3-H						426	130	730	345	1/2"																									
NSF25-120SR3-H						426	145	730	370	1/2"																									
NSF25-140SR3-H						426	155	730	390	1/2"																									
NSF60-245SR2-H						F60	1420	3100	240	225	730			345	343		545					1/2"	NSF60-220SR1-H	F60	1420	3100	240	225	730	320			343	545	1/2"
NSF60-270SR2-H	730	370	730	345	1/2"																														
NSF60-320SR2-H	730	420	730	370	1/2"																														

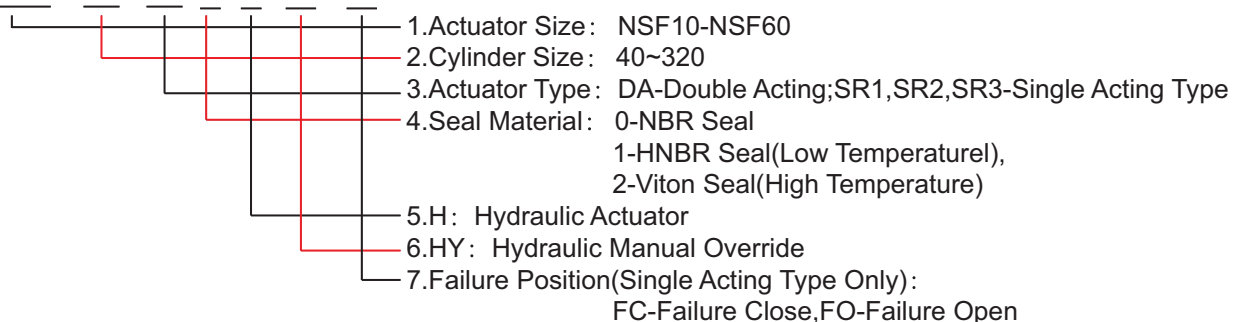
Dimension- Double Acting (Hydraulic Actuators)



Model	Connect Flange	L1	L2	H1	H2	A	m2	m1	Pressure Port
NSF10-40DA-H	F10	345	124	102	82	85	82	123	1/4"
NSF12-40DA-H	F12	398	140	105	85	85	87	143	1/4"
NSF12-50DA-H						92			1/4"
NSF14-60DA-H	F14	455	170	114	87	100	89	155	1/4"
NSF14-70DA-H						110			1/4"
NSF16-70DA-H	F16	530	194	119	98	110	105	180	1/4"
NSF16-80DA-H						130			1/4"
NSF25-90DA-H	F25	610	226	128	122	110	150	222	3/8"
NSF25-100DA-H						130			3/8"
NSF25-110DA-H						138			3/8"
NSF30-110DA-H	F30	730	275	163	139	155	175	262	3/8"
NSF30-120DA-H						170			3/8"
NSF30-130DA-H						180			3/8"
NSF35-130DA-H	F35	855	332	180	177	180	207.5	320	3/8"
NSF35-150DA-H						195			3/8"
NSF35-170DA-H						270			1/2"
NSF40-170DA-H	F40	990	402	202	190	270	238	377	1/2"
NSF40-190DA-H						290			1/2"
NSF40-220DA-H						320			1/2"
NSF48-190DA-H	F48	1150	475	238	227	290	280	450	1/2"
NSF48-220DA-H						320			1/2"
NSF48-245DA-H						345			1/2"
NSF48-270DA-H						370			1/2"
NSF60-245DA-H	F60	1420	568	240	225	345	343	545	1/2"
NSF60-270DA-H						370			1/2"
NSF60-320DA-H						430			1/2"

Order Information

NSF30 - 110 - DA - 1 - H - HY - FC



IEC/ATEX/FM/CSA Approved



3/2 & 5/2 way in-line & Namur Mounted Solenoid Valve.

1. Spool valve structure
 2. Static seal design
 3. Material in aluminum & 316SS
 4. Encapsulated coil in NASS coil
 5. EExdIICT6 coil enclosure in Aluminum & 316SS.
- Approved by ATEX & NEPSI.

NEPSI Approved



Rotary & Linear Type E/P Positioner

1. The optional output signal: mechanical switch & 4-20mADC feedback
2. The optional accessories: air filter regulator or dome type indicator(only in IP66, rotary type)
3. Enclosure in IP66, EExdIIBT6 & EExdIICT6(Approved by ATEX & NEPSI)

ATEX / NEPSI Approved



Position Monitoring Switchbox

1. Sensor Type:
Mechanical Type (2,3 or 4 x SPDT, DPDT)
Proximity Type (Autonis, P+F, Truck ...)
2. The optional output signal: 4-20mADC or 0-5K/10K ohm potentiometer
3. Housing material in aluminum or 316SS
4. Enclosure in IP67, EExdIIBT6 & EExdIICT6 (Approved by ATEX & NEPSI)
5. IP68 enclosure tested in 30M / 24HOURS



Manual Override (Declutchable Wormgear Operator)

1. Cast Iron/Aluminum Body:
The output torque: 300/ 700/ 1,200/ 2,000/ 3,100Nm
2. Ductile Iron Body:
The output torque: 12,000/ 18,000/ 25,000/ 32,000/ 70,000Nm
The actuator & valve connection complies with ISO5211 standard



Air Filter Regulator

1. 5um filtration & high flow capacity
2. Panel Mounting is optional
3. 1/4" vented spring case is optional
4. Housing material in aluminum & 316SS

316SS

Butterfly Valves



Center-Line Soft-Seated Butterfly Valve

1. Wafer/Lug Valve:
Dimensions: 2" ~ 56"
Pressure Rating: PN10-16/ANSI125-150LB/JIS10-16K
2. Double Flanged Valve:
Dimensions: 2" ~ 48"
Pressure Rating: PN10-16/ANSI125-150LB
3. Wafer/Lug Valve (PTFE/PFA Lined):
Dimensions: 2" ~ 24"
Pressure Rating: PN10-16/ANSI125-150LB
Operation: Hand-Lever, Wormgear Operator, Pneumatic and Hydraulic Actuators, Electric Actuators.

Triple Offset Bi-Directional Metal Seat Butterfly Valve

(Bubble Tight, Replaceable Disc Ring & Valve Seat)

High Performance Double Eccentric Butterfly Valve



Triple Offset Metal-Seated Butterfly Valve

- Wafer/Lug/Double Flanged/Butt Weld Type:
1. Dimensions: 2" ~ 80"
Pressure Rating: PN10-25/ANSI150-300LB
 2. Dimensions: 3" ~ 24"
Pressure Rating: PN40-100/ANSI600-1500LB
Operation: Wormgear Manual Override
Pneumatic and Hydraulic Actuators, Electric Actuators.

High Performance Double Eccentric Butterfly Valve

- Wafer/Lug/Double Flanged/Butt Weld Type:
1. Dimensions: 2" ~ 24"
Pressure Rating: PN10-25/ANSI150-300LB

Ball Valve



Ball Valve (Floating Ball)

1. Dimensions: 1/4" - 4", 1000WOG/2000WOG,
Full Port, thread /Butt Weld/Socket Weld / Tube
End Connection.
2. Dimensions: 1/2" - 8"
3. Pressure Rating: PN10-PN40/ANSI150-300LB/
JIS10-20K
Operation: Wormgear Manual Override, Pneumatic
and Hydraulic Actuators, Electric Actuators.

PASCO manufactures a wide range of pneumatic actuators, electric actuators and the accessories of pneumatic actuator (limit switchbox, solenoid valve, manual override ---etc.) for quarter turn valves

supply the following product range:

	<p>NK series rack & pinion type (CE-ATEX certified and PED compliant) 14 models, the output torque from 9Nm(80in.lbs) to 3,920Nm(34,660in.lbs) at 6 bar air supply. ISO5211/DIN3337 for valve connection, VDI/VDE 3845(Namur) standard connection for solenoid valve and shaft top end(limit switchbox or E/P positioner), +/-5 degree stroke adjustment. 25~30um standard hard anodized treatment on actuator body and over 120um epoxy coated on end caps which meet ASTM B117 qualification(salt spread test over 1,000 hours and no corrosion).</p> <p>PTFE, Polyester, Nickel, Ceramic and Epoxy coated are available on request.</p>
	<p>NSF series scotch yoke type pneumatic and hydraulic actuators (CE-ATEX certified and PED compliant) The output torque from 187Nm(1,655in.lbs) to 226,200Nm (2,001,870in.lbs) at 6 bar air supply. Anti-corrosion painting on outer body and cylinder as standard. VDI/VDE 3845(Namur) standard connection for shaft top end(limit switchbox or E/P positioner), +/-10 degree stroke adjustment. ISO5211 standard for valve connection. PTFE coated on inner cylinder surface. Hydraulic manual override is available for big size actuator.</p>
	<p>NTE series electric actuator, CE approval 13 models and the output torque from 18Nm(159in.lbs) to 6000Nm(53,106in.lbs), compact design, die-casting aluminum alloy housing, alloy steel with heat treatment gear driving unit, integral wormgear & drive shaft, 30% duty rating, detachable crank handle, ISO5211(option), IP67 enclosure.IP68 for option.</p>
	<p>NTE-02L Quarter Turn Electric Actuator Output torque 25Nm(222in.lbs),operation time 10Sec;voltage 24VAC,110VAC & 220VAC for option,ABS housing, 30% duty rating,IP65 enclosure.</p>
	<p>NTQ electric actuator, CE approval(IP67 & EExdIIBT4 enclosure) 13 models, the output torque from 100Nm(885in.lbs) to 6,000Nm(53,106in.lbs), de-clutchable manual override, 2xSPDT each for open & close, torque switch: 1xSPDT each for open & close. space heater, self-lock, IP67 & EExdIIBT4 enclosure.</p>
	<p>The fully range accessories(Limit Switchbox, Solenoid Valve, Dec clutchable Manual Override, Air Filter regulator, E/P Positioner ---etc).</p>
	<p>Ball Valve 1/4"~ 4": 1000WOG/2000WOG screwed/butt weld/socket weld/tube end full port ball valve 1/2"~8": PN10~PN40/150lb~300lb/JIS10K~20K; 2 way & muti-way ball valves and ceramic lined flanged end full & reduced port ball valves are available</p>
	<p>Soft Seated Butterfly Valve Wafer/Lug type: 2" ~ 56": PN10~PN16/125lb~150lb/10K~16K; The other sizes are available upon request Double flanged: 2"~48": PN10~PN16/125lb~150lb; The other sizes are available upon request PTFE lined: Wafer/Lug type, 2"~24": PN10~PN16/125lb~150lb/10K~16K ; The other sizes are available upon request</p>

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